



## Collaborative Surface Management Solutions

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The airport surface is the key shared resource where all stakeholder responsibilities converge – coordination and management is critical for efficiency, security and safety. The systems used for coordination and situational awareness are typically siloed; security tends to rely on Closed Circuit Television (CCTV) based systems, Air Traffic Control (ATC) on Airport Surface Detection Equipment, Model X (ASDE-X) or Advanced-Surface Movement Guidance and Control Systems (A-SMGCS).

**The evolution of Intelligent Video (aka computer vision) systems allows for the integration of security CCTV with Air Traffic Management (ATM) systems, resulting in improved situational awareness, safety and security for both groups.**

A Collaborative Surface Management (CSM) system:

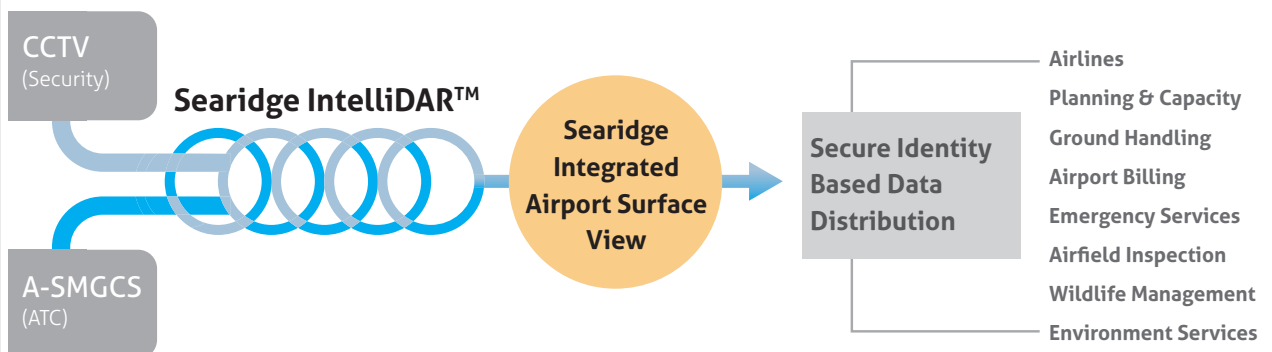
- ▶ Creates a common surface management system that can be shared with airlines, emergency services, planners, ground operations, environmental management and related stakeholders as part of a wider Collaborative Decision Making (CDM) process
- ▶ Provides stakeholders with direct benefits of:
  - └ Time and cost savings
  - └ Reduction of phone and radio time (> 50%)
  - └ More effective taxiway usage
  - └ Higher availability of information (CDM)
- ▶ Fully leverages the investment in existing infrastructure; maximizing system benefits while minimizing costs
- ▶ Directly improves security and can lead to increased airport capacity
- ▶ Extends ATC situation awareness to apron and maintenance areas; extends airport ops/security situation awareness to the entire airport surface in real-time
- ▶ Improves safety.

As airports grow and evaluate their surface management needs, Intelligent Video is emerging as the right technology to help Air Navigation Service Providers (ANSPs) and airports:

- ▶ Comply with NextGen and SESAR program initiatives
- ▶ Increase safety
- ▶ Improve security
- ▶ Enhance CDM
- ▶ Augment existing surveillance
- ▶ Develop and evaluate remote tower capabilities
- ▶ Deploy remote apron management capabilities
- ▶ Mitigate new tower construction
- ▶ Enhance tower visibility.

*“NAV CANADA believes in the potential of intelligent video technology to drive the adoption of new methods to support air traffic surveillance at airports. Searidge continues to demonstrate innovation and leadership in this space and together we intend to bring to market proven solutions that meet strict industry standards.”*  
**– John Crichton, President & CEO, NAV CANADA**

## Searidge Integrated Airport Surface Management System



## Products & Services

The Searidge product portfolio consists of its flagship intelligent video platform IntelliDAR™ and its advanced ATC-Grade video system. For ANSPs and airports looking to augment existing surveillance systems, or for those looking for a stand alone system to address a specific problem – Searidge offers proven technology and a range of deployment options that are flexible and expandable allowing users to increase coverage as required.

### Industry Leading Technology: IntelliDAR™

**The Searidge intelligent video platform, IntelliDAR™, is a state-of-the art airport surface management system.**

— The system processes video from a series of video sensors networked together to provide real-time geospatial positioning of all targets in a given area. The video captured by the cameras is then processed using advanced computer vision algorithms in order to provide: non-cooperative target detection, continuous tracking, geospatial positioning, and a variety of target attributes. Like all Searidge products, IntelliDAR provides standard, open interfaces and can be integrated into an existing airport-ANSP system configuration.

*“The IntelliDAR system at the Cologne Bonn Airport will assist the air traffic controllers to safely manage ground traffic movement in the monitored zones...this deployment will also allow DFS to further validate and certify the non-cooperative surface surveillance system for possible use at other sites throughout Germany.” – Detlef Schulz-Rueckert, Chief Operational Engineering, DFS Deutsche Flugsicherung GmbH*

*“With the growth we are experiencing at our airport, it is important to take advantage of leading technology like IntelliDAR to provide excellent levels of service to our airline customers.” – Hans-Peter Buhs, Engineering Department Head, Cologne Bonn Airport*

### Improve Tower Line of Sight: ATC-Grade Video

**Advanced video processing technology to intuitively consolidate multiple camera scenes into a simulated single out-of-the-window (OTW) view of the area not visible from the tower.**

— Full visual confirmation of the situation helps controllers effectively manage the ground traffic with a high degree of

confidence. The system also provides several safety and reliability features including real-time system health and error alerts. — ATC-Grade video has been built from the ground up for use in an air-traffic-control environment. It is deployed and operational in ATC towers today, and controllers around the world depend on it daily to issue clearance for takeoff and landing. — The system can also be used by Security personnel for perimeter protection and intrusion detection; automating the detection of human and vehicle activity in restricted areas and controlled zones. — As requirements evolve, it is possible to upgrade the ATC-Grade video product to a full IntelliDAR system. By adding the extensive processing power of IntelliDAR, airports can fill gaps in their radar coverage to provide comprehensive and complete situational awareness.

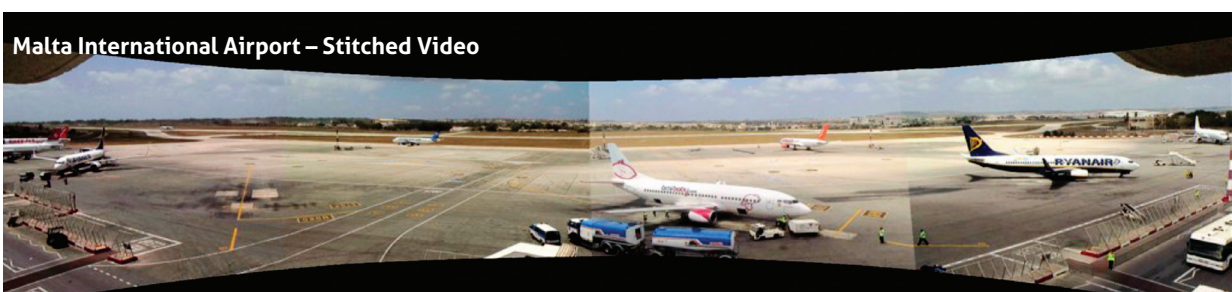
*“We selected Searidge’s ATC Grade video solution because it met both our functional and safety needs today, and had the scalability and flexibility to grow as the needs of our airport evolve. We also valued the company’s track record of successfully deploying video systems for both airports and NAV CANADA.”*

*– Paul Garbiar, Vice President, Infrastructure and Technology, Edmonton International Airport*

### Integration with Tower Automation Platforms

**Combining Searidge’s surveillance technology with an integrated tower platform can unlock the benefits of Collaborative Decision Making (CDM) at airports large and small.**

— This integration of surveillance information with air traffic management data and communications is a critical piece to providing more efficient airport management on the surface and in local airspace. ANS providers stand to benefit from this approach as they develop their own integration roadmap to deal with the challenges of modernizing aging infrastructure and preparing for future capacity.



## Solutions for ANSPs

### Remote Aerodrome Control Services

#### Providing Air Traffic Control services independent of controller/operator location.

— The solution equips controllers with an advanced set of decision support tools that enable them to provide advisory or control services to aircraft and vehicles at geographically independent airfields. — Our video systems are currently being used by controllers to control areas of the airport they cannot see. We are now taking these systems to the next step of a fully remote environment or an on-site contingency tower.

*"IntelliDAR™ was selected by Massachusetts Institute of Technology (MIT) Lincoln Laboratory for its Staffed NextGen Tower (SNT) surveillance research program, commissioned by the Federal Aviation Administration (FAA).*

— The Searidge solution provides enhanced situational awareness to air traffic controllers with real-time video for visual confirmation of targets, radar-like coverage of all non-cooperative targets and an OTW view by using video from cameras deployed parallel to each other and "stitching" them together to provide a single panoramic view of an area.

### Tower Blind-Spot Coverage

#### Enabling air traffic controllers to see remote or obstructed areas of the airport surface.

— The solution allows for the strategic deployment of video sensors to provide visibility of areas that are blind to the controller. The camera views can be "stitched" together to provide a simulated panoramic OTW view; and the data it provides to users is safe, reliable and high fidelity.

### Low-Cost Ground Surveillance

#### Based on a distributed set of non-cooperative sensors (video cameras) that are strategically installed at various points throughout the airport surface, the solution serves as a viable alternative to A-SMGCS and ASDE-X.

— From a camera sensor we are able to detect all surface traffic regardless of on board equipment and provide real-time position data to a controller working position. The camera views are presented in a single display, allowing the controller to see all the ground traffic in an intuitive one-look view, rather than having to scan multiple CCTV screens.

*"The Searidge track record in delivering high quality, innovative solutions is excellent and we are pleased to expand the solution to now include LCGS capability."*

— Larry Fenech, Chief Executive Officer, Malta Air Traffic Services

### Runway Incursion Monitoring and Collision Avoidance System

#### Warning pilots and air traffic controllers before incursions take place.

— The Searidge Runway Incursion Monitoring and Collision Avoidance System (RIMCAS) is a localized system based on intelligent video that is reliable, accurate, and scalable. High camera frame rates allow for rapid calculation of precise location and velocity such that incursions can be detected, or even predicted, in real-time, and alerts can be generated before or milliseconds after an incursion has taken place.

## Solutions for Airports & Airlines

### Apron Management, Gate Assignment and Billing

#### Seamless integration of aircraft identification and position at gates.

— ANSPs track vehicles in the air, and this data can be passed to operations automatically when they reach the airport, without manual input. Information such as gross weight, carrier, taxi times, and stand allocation can be aggregated and reported on an hourly, daily, weekly, or monthly basis as desired. — With the Searidge solution, similar data can be made available to apron towers and operations staff in real-time via a one-look situational display, detailing all desired information at a glance on a visual map of the non-movement area. This is achieved by leveraging rich data from the Airport's AODB (Airport Operations Database), Intelligent Video Surface Data, FIDS, and other information sources that may be available.

### Centralized Airport Operations Centre/ Remote Apron Control

#### Centralizing operational units via panoramic stitched video – simulated OTW views.

— Using the Searidge ATC-Grade video product, it is possible to simulate an OTW view for one or multiple geographically dispersed aprons, de-icing pads, aircraft parking areas and consolidating the various views into one operator display. The solution eliminates the need to be physically looking out of the window to see live traffic activity, and instead allows for a centralized operations centre approach, which can free up valuable human resources and real-estate, and increase throughput as airport operations personnel can be co-located in one cohesive unit.

*"Over the past 18 months, Searidge has provided us with a remote apron management system that has allowed us to improve the communication efficiency at our airport."*

— Larry Fenech, Chief Executive Officer, Malta Air Traffic Services

### ASDE-X & SMGCS Augmentation

**Compliments an existing surface movement radar or MLAT system to provide a cost effective, real-time view of blind spots, coverage gaps, and hot spots.**

— The robust Searidge Non-Cooperative Surveillance System (NCSS) outputs surface movement reports in ASTERIX format for seamless integration with existing systems. Detection and tracking data can be displayed on a stand-alone Human Machine Interface (HMI), or fused with ASDE-X and A-SMGCS via a fusion processor to effectively fill in the blind areas, or gaps, and help to realize the full potential of the ANSP and/or airport's investment.

*"The technology has the capability to be an additional sensor in a complex airport like Frankfurt or Munich, supplementing information provided by primary radar and multilateration. We call this a gap-filler solution. At less than a tenth the cost of primary radar, this is an important application."* – Detlef Schulz-Rueckert, Chief Operational Engineering, DFS German Air Navigation Services

### Digital Aviation Weather Camera

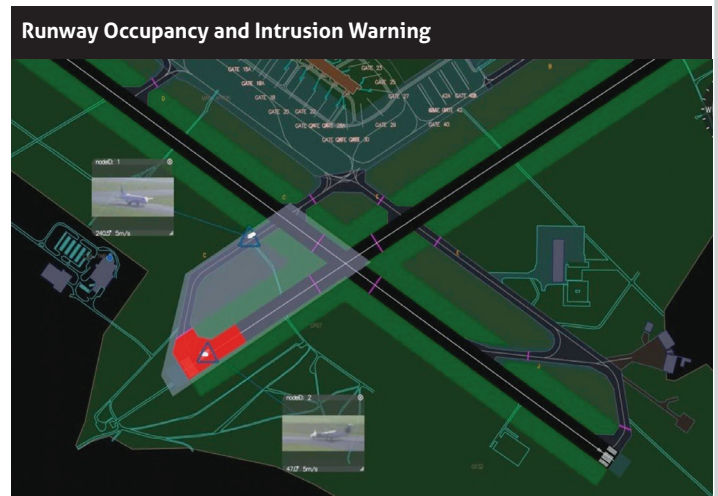
**Alerting and preparing pilots for adverse weather conditions.**

— The Searidge Digital Aviation Weather Camera solution is a modernized, digital-weather-camera system that provides sector visibility via intelligent video. The system helps to promote flight safety by providing current weather conditions to pilots, assisting them in making timely weather-related decisions with confidence.

### Runway Monitoring

**Giving controllers "eyes" when they cannot see or cannot see very well.**

— The Searidge Remote Runway Monitoring solution includes the installation of high fidelity video sensors in close proximity to the distant controlled surfaces that are of concern to air traffic controllers. The system gives them "eyes" where they can't see or can't see well and remotes this information via an advanced data transfer methodology, which is accepted by air traffic control towers on two different continents, where it is operational today.



### Perimeter Protection and Intrusion Detection

**Automate the detection of human and vehicle activity in restricted areas and controlled zones.**

— The Searidge Intrusion Detection solution is a scalable system that automatically monitors and depicts all targets in the area of interest to the security personnel in real-world LAT/LONG positions on a an intuitive 2-D map display. Rather than having to continuously and simultaneously look at and scan numerous CCTV screens for possible intrusions, the system produces audible and visual alerts to the security operator such that no intrusions go undetected. This affords the operator more time to perform auxiliary tasks, and handle only the exceptions as intrusions take place. All video and map view data is recorded and archived to be accessed for incident review, investigations, and training.

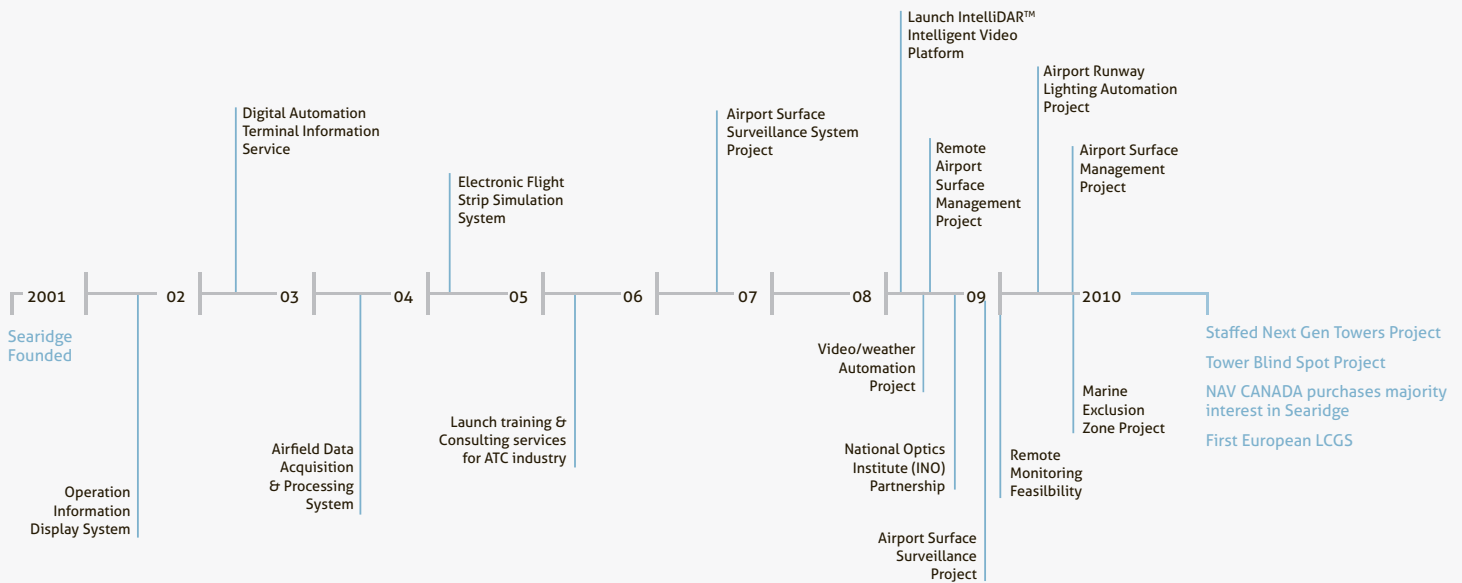
### Automated Runway Lighting

**Decrease controller workload by automating the control of runway lights.**

— The Searidge Runway Lighting Automation solution monitors runways and adjoining taxiways with all-weather performance sensors, and based on predefined rules, automatically turns the lights on and off as required by procedure. — Through an adaptation and training process and the use of advanced video analytics algorithms, the system can "learn" the local traffic patterns such that the automated control functions adhere to the operational rules with a high degree of confidence that is expected of ATC-Grade systems.

## About Searidge Technologies

**Searidge has been bringing ATC-Grade solutions** and services to market for over a decade. The company is exclusively focused on the Air Navigation Services (ANS) industry and as such understands its unique needs and requirements. Searidge is experienced at delivering mission critical applications that meet the strict safety and reliability guidelines of the industry. — The Searidge Professional Services team specializes in the design, analysis, testing, and integration of a variety of digital video acquisition systems and image processing techniques in support of complex air traffic control and airport operations functions. The team can also conduct detailed feasibility studies to assist in filling the gaps in an existing surface management strategy, or help develop a new strategy. Searidge offers expert analysis to assist in defining requirements, gap analysis, solution selection and implementation, and integration.



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Searidge Technologies provides intelligent video solutions to Air Navigation Service Providers and airports to help them cost effectively increase safety and efficiency of surface management operations. The company's intelligent video platform IntelliDAR™ is a robust Non-Cooperative Surface Surveillance (NCSS) system and the first operational system of its kind in an air traffic control tower to provide detection, positioning, and tracking of all targets on an airport surface. — Working with industry leaders such as DFS, EUROCONTROL, FAA, and NAV CANADA, Searidge solutions are installed in sites throughout Europe, Middle East and North America.

